Mathematical Terms in Pilipino

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The following translations of mathematical terms are among those scientific terms collected or composed by Mr. and Mrs. Bienvenido Miranda, both professors in Chemistry at the University of the Philippines, in their book Scientific English, *published by G. Miranda and Sons.*

Mr. and Mrs. Miranda give the background and rationale for their work in the preface, quoted here in part.

"Composing an English-Filipino vocabulary for the natural sciences and mathematics can be controversial. It points to things that disturb people. It implies a shift from English to Filipino as a medium of communication. Worse – to some, anyway – it raises the spectre of abandoning our position as one of the few English-speaking countries and the only one in the Far East. While others are striving hard and hurriedly to learn the defacto universal language, we would deliberately drop it, wail many Filipinos, perhaps in honest bewilderment, or exclaim in bristling belligerence. The shift would be a giant step backward, a stupid throwback, and all that. Important as these observations are, however, this piece is hardly the occasion to discuss them.

The use of Filipino in scientific discourse is gravely limited by a number of factors, including the relative facility in English of Philippine scientists and science teachers, and the anemic Filipino vocabulary that stymies even the ardent advocates of the national language. Since the Americans imposed on us their school system and their language, a debilitating cycle has been created over the scores of years, with scientists explaining science, in nothing but English, to teachers who teach science in English to students who ultimately become the scientists and the science teachers. All the Philippine languages were squeezed out and never had a chance to evolve a scientific vocabulary.

The present work started out as an academic undertaking, a basic inquiry into the capabilities of Filipino for scientific communication. It was inspired by a strong conviction that the beauty and force of Philippine languages, principally Tagalog, are adequate to identify things, explain concepts, and describe phenomena, processes, and procedures in the natural sciences and mathematics. There was a reason, too, namely to make possible the implementation of a directive to teach in Filipino freshman chemistry and introductory physical science at the University of the Philippines. The wisdom of teaching science in this language was not at issue; the implications of replacing English in schools, and elsewhere, did not rate consideration because a decision to do so was not

the authors' prerogative. The task was clear: to compose a vocabulary for an immediate need and a possible long-ranged need. It might be added: for better or for worse. As practitioners of basic research the authors were not averse to pursuing the study however it might turn out.

The initial and fundamental guidelines were that the vocabulary is more for future generations than for the present, that it has to have distinctly Philippine character in order to give it a rightful place in the National Language, and that it must be accurate and simple but elegant to the extent possible. These encompass the operating guidelines presented in succeeding sections of this book.

The output so far has been a collection of about three thousand words and phrases for biology, chemistry, mathematics, and physics. No one, least of all the authors, will regard the work finished. The search for terms must go on and on, and others will have to join in the effort."

The purpose of the book, then, and of this Matimyas' excerpt, is

" . . . . to present the problem with its partial solution, and thereby generate awareness and interest. It could also provoke criticisms, or invite encouragement; no matter, both will be helpful in the endeavor to enrich the National Language as well as putting it to a severe test."

ACUTE ANGLE Sihang makitid (JVP[1])
ALTITUDE Tayog
ANGLE Siha (JVP)
ARC Balantok (PSL[2])
AREA Awak
AVERAGE (n) Palas
AXIOM Sinaad (something stated)
AXIS (Cartesian Coordinate System) Agwatan (distance marker)
BAR GRAPH Subara (sukat + bara)
BASE (of exponential number) Batay
BASE (of triangle) Takad (JVP)
BILATERAL SYMMETRY Magkabilang pagkakatulad
BRACE (grouping symbol) Kulikop (kulot na likop)
BRACKET (grouping symbol) Saklong
CALCULATOR Pantuos
CANCELLATION Hati-uli (hati + uli = divide by the same number)
CENTER Lunduyan/centro/sentro
CENTURY Dantaon (Daang taon)
CLOCKWISE Ikanan (ikot + kanan)
CONCENTRIC Isalunduy (one-centered)
COORDINATES (Cartesian) Hitagwat (higa + tayo + agwat)
COORDINATES (Polar) Sihagwat (siha + agwat)
COUNTER CLOCKWISE Ikaliwa (ikot + kaliwa)
CROSS-SECTIONAL AREA Awak na pahalang/awak-halang
CUBED (power 3) Tinatlo
CURVE Kilò (JVP)
DECIMAL Sampuan
DECIMAL NUMBER Sinampu
DECIMAL PART Sinampung bahagi
DECIMAL PLACE Lugar sa sinampu
DECIMAL POINT Tuldok/Tuldok-sampuan
DEGREE (Angular) Antas
DERIVATIVE Hango/Pahango
DIAMETER Bantod (PSL)
DIGIT (number) Taliri (Pampango for finger)
DIRECTION Dako
DIVIDEND Hinahati

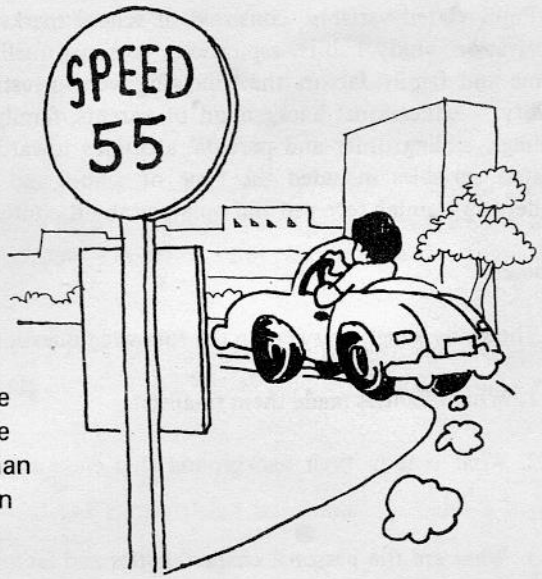
[1]Jose Villa Panganiban, *Diksunaryo Tesauro Pilipino-Ingles*, Manlapaz Publishing Co., Q.C. 1972.

[2]Pedro Serrano Laktaw, *Diccionario Hispano-Tagalo*, Manila 1896.

DIVISION Hatian
DIVISOR Panghati
EQUATION Tumbásan
EVEN NUMBER Tukol na numero
EXPONENT Paulit
EXPONENTIAL Pauli-ulit
FACTOR Karami (from kasamang nagpaparami)
FIELD Larang (from larangan)
FRACTION Bahagisa (bahagi sa isa)
FUNCTION Kabisa (from kasamang bisa)
GEOMETRY (relationships of points, lines, surfaces, and solids) Aral-tuglibo (from tuldok + guhit + lipaw + buo)/Munsukat (from mundo + sukat; the original geometrein = to measure the earth)
GRAPH Sularaw/Suklaraw (sukat + larawan)
GRID Sala-guhit (from sala-sala = network)
GROUP Pulutong
GROUP THEORY Teoria-pulutong
HORIZONTAL AXIS Higang agwatan
HYPOTENUSE Gilis (gilid na pahilis)
IDENTITY Kaisahan
IMAGINARY NUMBER Numero sa isip
IMPROPER FRACTION Tiwalang bahagian
INDEX (of radical) Panliit
INDUCTION (from part to whole) Palawig (broadening)
INTEGER (integral number) Numerong buo
INTERSECTION Bagtas
INVERSE PROPORTION Bagayang saliwa
INVERSE SQUARE RELATION Dinalawang saliwaan
LEAST COMMON DENOMINATOR Isahuling pangilalim/Isa-laging pangilalim
LINEAR Tuwid
LOGARITHM Logulit (symbol log)
MANTISSA (logarithm) Mantisa
MAPPING Tapatan
MASS Migat (from pamimigat, symbol m)
MATHEMATICALLY Samatematika
MATHEMATICIAN Dalub-matematika/Matematiko
MIXED NUMBER Halong numero
MULTIPLICAND Pinararami
MULTIPLICATION Paramihan
MULTIPLIER Pamparami
MULTIPLY Magparami
NEGATIVE NUMBER Negatibong numerong pabawas
OBTUSE ANGLE Sihang lapad
ODD (number) Gansal
ONE HUNDREDTH Hatdaan
ONE TENTH Hatipu
ONE THOUSANDTH Hatlibo
ORDINATE Tayuwat (tayo + agwat)
ORIGIN Mula
OVAL Ovalado
PARALLEL Agapay
PARALLELOGRAM Parigapay (from pareho + agapay)
PERCENT Bahagdan (from bahagi + daan)
PLACE VALUE SYSTEM Halaga-lugaran
PLOT (n) Guhit
PLANE (flat surface) Lapyang lipaw/laplipaw
POSITIVE NUMBER Positibong bilang/Padagdag na bilang
POWER OF TEN (exponent of ten) Paulit na sampu
PRODUCT (of multiplication) Nagindami (result of multiplying)
PROPORTION Bagayan
PYRAMID Tagilo
QUANTITY, SCALAR Gaano
QUANTITY, VECTOR Daksukat (Dako + sukat; dako = direction)
QUOTIENT (division) Naginghati (result of dividing)
RADIUS Lihaba (liha + haba; liha = sector of circle)
RATIO Tandi (from panagtandi = comparison, Ilongo language, MJE[3])
REAL NUMBER Numerong tunay
RECIPROCAL Isahati (one divided by . . .)

[3]M.J. Enriquez, et. al., English-Tagalog-Ilokano Vocabulary; English-Tagalog-Visayan Vocabulary. Philippine Book Co. 1949.

RECTANGLE Parisiha (paris and siha = same angles)
REFLECTION (visual sense) Aninag/kinang
RIGHT ANGLE Ayos-siha
RING Sinsing
ROOT (of equation) Lútas (from kalútasan = solution)
ROOT (exponential) Panliit/Pampaliit
ROTATION Paginog
SLOPE Hilig
SOLUTION Lútas
SOLVE Lutasín
SPEED Bilis/tulin
SQUARE Parisukat (JVP)
SQUARED (as x^2) Dinalawa
SUM Kabuuan/Dagup (Ilokano language)
SURFACE Lipaw (from halipaw = surface matter) (JVP)
SYMMETRY Pagkakatimbang
TABLE (vertical and horizontal listing) Talatala
TABULATE Italatala
TANGENT Tagis
TERMS (of polynomial) Kabilang
THEOREM Huna
TRANSLATIONAL MOTION Tuwirang kilos
VELOCITY Dakbilis (from dako + bilis)
VERTICAL AXIS Tayong agwatan
WEIGHT Bigat/Timbang



If a man required 2 hours less time to drive a certain distance when he averaged 55 kilometers an hour than when he averaged 35 kilometers an hour, how far did he drive?